AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Previously Presented) A method comprising:

a) attaching at least two or more catalyst nanoparticles to at least two or more selected locations on a biomolecule, wherein the at least two or more catalyst nanoparticles are attached to the biomolecule with a defined spacing, wherein the defined spacing is defined by the spacing between the at least two or more selected locations on the biomolecule;

b) aligning the biomolecule with a substrate such that the at least two or more catalyst nanoparticles are ordered on the substrate in a non-random fashion;

c) covalently attaching the biomolecule to a substrate;

d) removing the biomolecule, such that the at least two or more nanoparticles attach to the substrate on at least two or more biomolecule directed sites, thereby defining a sites for nanotube formation; and

e) producing substrate attached carbon nanotubes on the at least two or more catalyst nanoparticles such that the resulting distribution of substrate attached carbon nanotubes is non-random.

2. (Previously Presented) The method of claim 1, wherein the biomolecule is a peptide, a protein or a nucleic acid.

3. (Previously Presented) The method of claim 2, wherein the biomolecule is a peptide or protein.

4. (Previously Presented) The method of claim 2, wherein the biomolecule is a nucleic acid.

5-7. (Canceled)

8. (Previously Presented) The method of claim 1, wherein the at least two or more catalyst nanoparticles are attached to the biomolecule before the biomolecule is attached to the substrate.

9. (Previously Presented) The method of claim 1, wherein the at least two or more catalyst nanoparticles are attached to the biomolecule after the biomolecule is attached to the substrate.

10. (Cancelled)

11. (Original) The method of claim 9, wherein the distance between adjacent carbon nanotubes is uniform.

12-14. (Cancelled)

15. (Previously Presented) The method of claim 14, wherein the biomolecule is aligned by optical tweezers, a direct current electrical field, an alternating current electrical field, a magnetic field, molecular combing or microfluidic flow.

16. (Previously Presented) The method of claim 15, wherein the biomolecule is aligned by double-stranded DNA/forced flow alignment.

17. (Previously Presented) The method of claim 1, wherein the at least two or more catalytic nanoparticles comprise ferritin.

18. (Original) The method of claim 1, further comprising using chemical vapor deposition with a hydrocarbon gas to produce the carbon nanotubes.

19. (Previously Presented) The method of claim 1, wherein the at least two or more nanoparticles are attached to the biomolecule using biotin-avidin or biotin-streptavidin binding.

20. (Original) The method of claim 1, wherein the substrate comprises silicon, silicon oxide, silicon dioxide, silicon nitride, germanium, one or more metals, and/or quartz.

21. (Previously Presented) The method of claim 1, wherein the at least two or more catalyst nanoparticles comprise iron, nickel, molybdenum, cobalt, zinc, ruthenium and/or cobalt.

22-38 (Canceled)

39. (Previously Presented) A method comprising:

a) attaching at least two or more catalyst nanoparticles to at least two or more selected locations on a biomolecule;

b) aligning the biomolecule with a substrate such that the at least two or more catalyst nanoparticles are ordered on the substrate in a non-random fashion;

c) attaching the biomolecule to a substrate;

d) burning off the biomolecule such that the at least two or more nanoparticles attach to the substrate on at least two or more biomolecule directed sites, thereby defining the sites for nanotube formation; and

e) producing substrate attached carbon nanotubes on the at least two or more catalyst nanoparticles such that the resulting distribution of substrate attached carbon nanotubes is non-random.

40. (Previously Presented) The method of claim 39, wherein burning off comprises heating to about 600 to 800° C.

41. (Previously Presented) The method of claim 1, wherein biomolecule comprises a single stranded DNA molecule.